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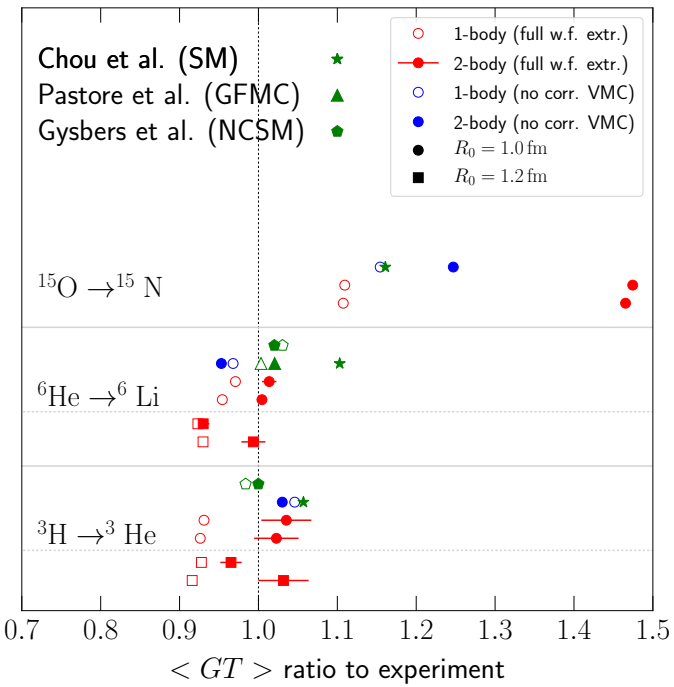
S. Gandolfi, J. Carlson T-2:
Calculation of $\beta-$ and double β-decay rates in nuclei

The knowledge of how neutrinos interact in nuclei is critical to an understanding of finite nuclei, neutrino physics and also to astrophysical environments like neutron stars and supernovae. Within this project we studied how nuclei decay through the emission of a neutrino and a lepton, i.e. β-decay. We implemented realistic treatments of many-nucleon correlations and currents to enable high-precision studies of neutrino physics.



- We have developed the numerical tools and computing codes to calculate weak currents in nuclei.
- We have used the Auxiliary Field Diffusion Monte Carlo method to calculate the nuclear wave function and the relevant nuclear matrix elements.

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